WHAT IS CLAIMED IS:

1. A semiconductor device comprising:

an amorphous transparent substrate;

an operative semiconductor film formed on said amorphous transparent substrate; and

an upper gate electrode and a lower gate electrode composed of the same metal material, disposed on said amorphous transparent substrate, and formed on the upper side and lower side of said operative semiconductor film while respectively placing an insulating film in between;

wherein said upper gate electrode and said lower gate electrode are different in the film thickness.

2. The semiconductor device according to claim 1, wherein said upper gate electrode has a smaller film thickness than said lower gate electrode has.

3. A semiconductor device comprising:

an amorphous transparent substrate;

an operative semiconductor film formed on said amorphous transparent substrate; and

an upper gate electrode and a lower gate electrode disposed on said amorphous transparent substrate, and formed on the upper side and lower side of said operative semiconductor film while respectively placing an insulating film in between;

wherein said upper gate electrode comprises a metal layer and a high-transmissivity material layer stacked thereon and having a larger transmissivity of light than said metal layer has; and

said metal layer of said upper gate electrode and said lower gate electrode are composed of the same metal material but differ in the film thickness.

4. The semiconductor device according to claim 3, wherein said high-transmissivity material layer of said upper gate electrode layer is composed of a transparent conductive material.

5. The semiconductor device according to claim 3, wherein said metal layer of said upper gate electrode is formed so as to have a smaller film thickness than said lower gate electrode has.

6. The semiconductor device according to claim 5, wherein said upper gate electrode and said lower gate electrode are formed so as to have an approximately equal gate length and so as to be aligned with each other.

7. The semiconductor device according to claim 1, wherein said lower gate electrode is buried in an insulating material, and said operative semiconductor film is formed in a planarized manner.

8. The semiconductor device according to claim 1, wherein said operative semiconductor film is formed so that the source/drain portion thereof is formed at a level lower than that of the channel portion thereof.

9. The semiconductor device according to claim 1, wherein said operative semiconductor film is composed of polysilicon.

10. The semiconductor device according to claim 9, wherein

said operative semiconductor film is formed so as to have a flow-patterned crystallinity characterized by a large streamline crystal grain; and

said crystal grain is formed so that the crystal boundary thereof originates from the other front-positioned crystal grain and fuses with other crystal grain on the rear side, and so that said crystal boundary runs nearly in parallel with the direction of laser scanning.

11. The semiconductor device according to claim 1, wherein said operative semiconductor film is formed in a thickness of 100 nm or less.

12. A method of fabricating a semiconductor device comprising the steps of:

depositing a metal material on an amorphous transparent substrate, and processing said metal material to thereby form a lower gate electrode;

depositing a semiconductor film on said lower gate electrode while placing an insulating film in between, and processing said semiconductor film to thereby form an operative semiconductor film; and

depositing the same metal material in a thickness smaller than that of the lower gate electrode, on said operative semiconductor film while placing an insulating film in between, and processing said metal material by light exposure from the back

side of said amorphous transparent substrate under masking by said lower gate electrode, to thereby form an upper gate electrode aligned with said lower gate electrode.

13. A method of fabricating a semiconductor device comprising the steps of:

depositing a metal material on an amorphous transparent substrate, and processing said metal material to thereby form a lower gate electrode;

depositing a semiconductor film on said lower gate electrode while placing an insulating film in between, and processing said semiconductor film to thereby form an operative semiconductor film; and

sequentially depositing, while placing an insulating film in between, the same metal material in a thickness smaller than that of the lower gate electrode, and a high-transmissivity material having a larger transmissivity of light than said metal material has, and processing said metal material and said high-transmissivity material by light exposure from back side of said amorphous transparent substrate under masking by said lower gate electrode, to thereby form an upper gate electrode aligned with said lower electrode.

14. The method of fabricating a semiconductor device according to claim 13, wherein said high-transmissivity material layer for composing said upper gate electrode is composed of a transparent conductive material.

15. The method of fabricating a semiconductor device according to claim 12, wherein said semiconductor film in an amorphous state is crystallized by irradiating an energy beam capable of generating an energy output having a time-dependent continuity.

16. The method of fabricating a semiconductor device according to claim 15, wherein said energy beam has an output instability of ±1% or less.

17. The method of fabricating a semiconductor device according to claim 15, wherein noise representing the time-dependent instability of said energy beam is 0.1 rms% or below.

18. The method of fabricating a semiconductor device according to claim 15, wherein said energy beam is generated by a solid-state laser based on semiconductor pumping.

19. The method of fabricating a semiconductor device according to claim 12, wherein said lower gate electrode is formed so as to be buried in an insulating material, and said operative semiconductor film is formed in a planarized form.

20. The method of fabricating a semiconductor device according to claim 19, wherein said lower gate electrode is formed so as to be buried by the chemical-mechanical polishing process.

21. The method of fabricating a semiconductor device according to claim 12, wherein said operative semiconductor film is formed so that the source/drain

portion thereof is formed at a level lower than that of the channel portion thereof in conformity with the geometry of said lower gate electrode.

22. The method of fabricating a semiconductor device according to claim 12, wherein process temperature in the individual process steps is set to 600°C or below.

23. The method of fabricating a semiconductor device according to claim 12, wherein said upper gate electrode is formed in a desired thickness by executing repeatedly the step of depositing the same metal material in a thickness smaller than that of the lower gate electrode, on said operative semiconductor film while placing an insulating film in between, and processing said metal material by light exposure from the back side of said amorphous transparent substrate under masking by said lower gate electrode.